

HISTORY OF THE FABULOUS ATHABASCA OIL SANDS

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Of The Journal

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Utilization of the Athabasca oil sands on a commercial basis is scheduled to start approximately 180 years after the deposit's existence was first recorded.

The written history of the oil sands originated in the journals of Peter Pond, who referred to the outcrops in his report of 1788. Pond was, among other things, an explorer and trader for the Northwest Company. Eleven years later, Alexander Mackenzie mentioned the "exudation of bituminous foundations" along the lower Athabasca river.

It was not until 100 years after Peter Pond's reference that R. G. McConnell of the geological survey of Canada did a geological reconnaissance of the Athabasca basin, including an investigation of the oil sands. His report, published as part of the survey report for the years 1890-91, aroused much interest in scientific circles. This interest grew with subsequent studies and reports.

FIRST ATTEMPT

It was a German, Count Alfred Von Hamerstein, who first attempted economic recovery of oil from the sands. Von Hamerstein had been enroute to the Klondike by the overland route but instead of continuing stayed to prospect along the Peace and Athabasca rivers.

From gold his interest turned to the oil sands. According to evidence which he gave before a Senate committee in 1907 he had been drilling for oil at Poplar Island about six miles below Fort McMurray.

Other interests drilled farther down stream in the vicinity of McKay. This drilling was no doubt instigated by the conviction of both Mr. McConnell and Dr. George Dawson of the Geological Survey that a liquid phase petroleum existed in connection with the oil sands.

Not only were private interests involved in this early drilling but these geologists persuaded the federal government to get into the act by doing some drilling of its own. In 1893 Parliament voted \$7,000 to be entrusted to the geological survey for "the purpose of initiating this work."

It was decided that the first hole should be sunk in the vicinity of Athabasca at which Mr. McConnell estimated the oil sands would be encountered at a depth of from 1,200 to 1,500 feet.

The hole never reached this depth, however. A large flow of gas was reported at a depth of 334 feet. This hole was cased in during the winter but it was unavoidably abandoned at a depth of 1,170 feet without encountering oil.

OTHER HOLES

The second and third federal drilling experiments were begun early in the summer of 1897. One was near the mouth of the Pelican river on the Athabasca and the other at Victoria (Pakan) on the Saskatchewan 70 miles below Edmonton.

The Pelican well struck gas which blew out of control for more than 20 years. Before striking the gas at 820 feet heavy oil which flowed from the hole was reported. It is possible that this oil came from the Pelican oil sand deposit which has recently been delineated. The other experimental hole was abandoned.

In 1913 Dr. S.C. Ells, an engineer with the federal department of mines was detailed to investigate the economic possibilities of the oil sands. His investigations, interrupted by the war, continued until 1930. He is the author of a comprehensive series of reports on the oil sands.

In addition, he was responsible for the preparation of topographical maps of oil sand areas along the lower Athabasca.

Among the investigations of Dr. Ells were those involving the possibility that the sands could provide a material suitable for use as a road surface.

In 1915 Dr. Ells laid three such surfaces on sections of 82nd St. Materials used included bitulithic, bituminous concrete, and sheet asphalt mixtures between the Fort Trail and 118th Avenue.

A report received 10 years later from A.W. Haddow, then Edmonton city engineer, stated that the surface had remained in excellent condition. In 1925 and 1926 three miles of highway in Jasper Park were paved with McMurray asphalt.

In a report given in 1926 Dr. Ells wrote:

LONG - SIGHTED

"Acknowledgement of the merits of cracked gasoline, and the increasing

tendency toward the complete conversion of crude, with coke and gas as by-products, appears to point toward diminishing supplies of oil asphalt for paving purposes."

In view of this forecast made 41 years ago, it is significant that recently a means was found to move Lloydminster heavy oil east to supplement the supply of asphalt in Ontario.

Meanwhile the Research Council of Alberta had started investigations in 1920 to determine if a means could be found to make economic use of the sands.

Two pilot plants were located in Edmonton and one on the Clearwater river near Waterways. These plants were part of the successful project to develop a hot water process to remove the oil from the sand. Also included in the research council program was a paving project - another section of the Fort Trail.

The research council hot water process, credited to Dr. Karl A. Clark, Dr. E. H. Boomer, and Dr. D. S. Pasternack, was used in 1930 to produce three cars of oil at the McMurray plant.

In 1932 the council reported the process had been improved to a point at which practically 100 per cent of the oil was being recovered by neutralizing the acid of the sand with soda ash. The use of lime or caustic soda must be avoided the report warned.

The following quote indicates that the council found that in the oil sands rules have exceptions:

"We have found it to be true of all the bituminous sand we have worked with that if you do this and this and that, it will separate very nicely. Then at the separation plant in the north the council ran into bituminous sand which did not separate nicely when one did this and this and that."

PRIVATE CAPITAL

While publicly owned agencies were thus at work on the problems of economic development of the sands, there were no dearth of reports that private capital was set to enter the picture on a large scale.

In March, 1924 two German chemists announced they had solved the riddle of recovering oil from the McMurray sand. They reported they had purchased areas of sand along the Athabasca River and would construct two plants; one on the Athabasca "the mineral will be mined and the sand extracted and the second plant in Edmonton where the bitumen and oils will be reduced and refined."

The company reputedly backing the Germans was named Angol-Canadian Collieries and Refineries and had a federal charter dated in August, 1923.

In January, 1924, an Emory E. Smith, an industrial engineer from California, came to investigate the oil sands for his client, The Alberta Tar Sands Products Company, Ltd. of Edmonton and San Francisco.

He announced that his company had spent \$60,000 experimenting on the sands with the intention of extracting oil on a commercial basis. Having failed to evolve a process, he stated that they had turned their entire efforts to the production of a cheap and serviceable road material.

Mr. Smith said they had succeeded and were prepared to turn out a trainload of road material a day from the first unit of a plant to be constructed at either Edmonton or McMurray.

He explained that the method was simple.

Various processes removed volatile oils and other undesirable constituents. The mixture would then be moulded into forms to comply with specifications and road requirements. The forms would be dusted to prevent sticking loaded onto railway cars and delivered. They could be piled along the roadside ready for a laying gang. Mixing, rolling and cumbersome machinery would not be required.

DEAL PROPOSED

In August of that year a resident of New York City, Roland T. Day, announced the readiness of a group which he represented to spend millions extracting gasoline and kerosene from the oil sands if a deal could be arranged with the federal authorities.

The deal was that he would spend \$1,000,000 on the sands if the federal government would lease his group 20,000 acres. The offer was refused by Ottawa on the ground that no lease would be granted unless (a) an extraction process satisfactory to the department had been outlined and (b) no lease of more than 1,920 acres was granted to one individual for one process.

In 1927 the managing-director of a California syndicate, R. D. Canfield, announced that his group was prepared to spend \$200,000 if the Alberta government would extend the Alberta and Great Waterways railway 3-1/2 miles. His group, the Alta-Pave syndicate proposed to use the asphalt from the sands to build Alberta roads up to California standards.

No more was heard of Mr. Canfield but the Research Council and the Alberta government continued road paving tests into 1927. Dr. K. A. Clark supervised the surfacing of a 300 yard section of the St. Albert Trail.

The government also surfaced the driveways to the Legislative grounds.

The first private operator to actually put the oil sands to commercial use was apparently Thomas Draper of Petrolia, Ont., whose company was McMurray Asphaltum and Oil Limited.

In June, 1924 Mr. Draper brought an asphalt heating and mixing plant from the east. The plant utilized in the paving of the Exhibition grounds sidewalk between the Manufacturers Building and the grand stand with McMurray asphalt.

In August, 1924 Robert M. Brick of Chicago, president of the Blackston Petroleum Company, came to Edmonton enroute north to inspect the oil sands deposits on behalf of the Bituminous Sands Company of America. He said he was very impressed but failed to return.

EXAMINED OUTCROPS

In September of that year S. M. Blair, then assistant to Dr. K. A. Clark research professor at the university completed detailed examination of representative outcrops over a distance of 25 miles from the vicinity of Fort McMurray to below Fort McKay were made.

Later in 1924 the federal department of interior announced the granting of a number of oil sands leases. Leases were limited to 1,920 acres per applicant. Federal officials insisted that operations on the leases must be confined to oil recovery and not to shipping oil sand for paving purposes.

In April, 1928, Glen M. Ruby, vice-president and general manager of the Hudson's Bay - Marland Oil Company Limited, announced plans for experimental work on the oil sands.

The plans involved construction of a plant at Waterways for extraction of the oil and rendering it suitable for commercial use. Mr. Ruby said his company expected to co-operate with both the federal and provincial governments in development of a commercial process.

In 1929 the Alberta and federal governments announced plans to pool resources for oil sand experiments.

The federal mines department mined sand to be used in experiments conducted by the Alberta Research Council in its plant at Dunvegan yards on Edmonton's outskirts.

The Dunvegan plant was to be replaced by a "semi-commercial" plant to be erected and operated by the research council in the McMurray district. The alluring prospect was gasoline production.

CALGARY FIRM

The prospect of producing oil from the oil sands appealed to a group of Calgarians. They organized and financed the Bituminous Sands Extraction Company Limited in 1929.

The company proposed to use a process patented by J. Owen Absher, a Montana oil expert. They hoped to obtain from 10 to 50 barrels a day at a cost of 10 cents a barrel. A large plant was to be built at Lynton station on the Alberta and Great Waterways Railway to process the oil.

Meanwhile a group headed by W. P. Hinton, former vice-president of the Grand Trunk Pacific Railway, was building a second experimental plant for the mechanical separation of oil from the sands at Dunvegan yards.

This plant belonged to the McLaughlin Centrifuge Company which utilized the cream separator principle to separate hydrocarbons from grains of McMurray sand.

According to a report 32 gallons of hydrocarbons were extracted from each ton of oil sand. "Out of each barrel of black viscous hydrocarbons may be refined 13 gallons of the very best anti-knock gasoline, six gallons of the finest grade of lubricating oil and 110 to 120 pound of the best grade of asphalt.

The cost of producing a barrel of products was estimated at no more than 50 cents.

The Calgary-backed Bituminous Sand Extraction Company Limited had managed to distill the oil in the ground according to a statement made by Curt Smith, president of the company late in 1929.

Treatment consisted of the direct application of heat. By forcing a combustible mixture to the bottom of the well oil was forced to the top. The product was declared a high grade oil; the analysis showing 30 per cent kerosene and the remainder lubricating oil.

In the same year a Vancouver company got in the act with still another process. The name of this organization, Swastika Oil Company, was selected before the Nazi symbol had acquired its evil meaning. The company was headed by Dr. J. W. Hall.

The extraction method was invented by Mrs. Jennie Rimmer. It involved forcing steam containing a high chemical content into an oil sand bed at high pressure.

The emulsified oil was held in suspension and pumped to the surface.

According to Mrs. Rimmer, the chemical used "grows in the north near the oil sand beds. It is easily gathered and inexpensive to prepare."

It was early in 1930 that the names of two American promoters, Max Ball and B. O. Jones from Denver, first entered the Alberta oil picture.

According to news dispatches of the day the pair represented a powerful financial group in the race to develop the oil sands. This group reportedly had a secret recovery method known as the McClay process.

This was a water separation process which had the distinction of being endorsed by Dr. Ells of the federal mines department. Dr. Ells had recommended the process for use by a government pilot plant at Fort McMurray.

At the same time a group planning to use the centrifugal process was also pressuring the provincial government for a permit to establish a plant. This group, represented by W. P. Hinton, was reported to be backed by Toronto and New York financial interests.

The Alberta government of that day was headed by John E. Brownlee. Premier Brownlee has been the principal champion of provincial rights in the negotiations to have administration of the natural resources of the prairie provinces turned over by the federal government.

JOINT POLICY

The transfer was expected shortly and negotiations concerning the oil sands would then be conducted in Edmonton rather than Ottawa. Meanwhile federal and provincial authorities tried to co-operate on the formulation of policy regarding individual applications for exploration permits and leases.

The Alberta government felt that the simultaneous entrance might lead to the failure of both.

Provincial authorities tried to effect a merger of the Denver and eastern interests but each stuck by its plan and its process. After failing to reach an agreement in Edmonton the negotiators went to Ottawa.

Federal officials in the department of the interior felt that the size of the proposed projects justified special consideration for each. As a result leases of 3,800 acres were suggested for the Hinton interests and those of Ball and Jones. Each proposed a \$250,000 plant and a total outlay of \$1,000,000. The provincial government approved the plans.

While the Ball and Hinton interests were making plans for plant construction more promoters were entering the picture.

The International Bitumen Company was organized by R. C. Fitzsimmons in 1927. A plant was constructed on the east side of the Athabasca River some distance downstream from Fort McMurray.

Much publicity was given to the shipment to Edmonton of 207 barrels of bitumen in 1930 by the company. Mr. Fitzsimmons is reported to have had plans for a \$250,000 plant and a refinery.

An option granted by Northern Alberta Explorations Limited 1932 for a period of six months involved freehold minerals to which rights had been obtained from the federal government 15 years previously. Nothing come of this development.

BOUGHT PLANT

Max Ball purchased the McMurray plant of the Alberta Research Council. This plant had been built near Clearwater River under the supervision of Dr. Clark.

However, his company, Canadian Northern Oil Sands Limited, in 1935 announced plans for a new plant to be built north of Waterways. Mr. Ball announced his objective to be a 3,000 tons a day operation.

In an address to the agricultural committee of the Legislature in 1935, Mr. Ball estimated the area of the sands to from 10,000 to 50,000 square miles, containing from 100 billion to 250 billion barrels of oil.

The Ball interests operated a pilot plant first in Denver and after August, 1934, in Toronto. The unit, called a flotation cell was reported by Mr. Ball to have operated with great success.

Meanwhile the same agricultural committee also heard from representatives of the Bituminous Sands Extraction Company. Representatives of the company were Claudius Fisher of Calgary and Curt Smith of Wetaskiwin.

This was the Calgary company which had proposed to produce oil from shallow wells by using heat to crack, extract and distill the oil in a single operation in the ground.

The committee was told that provincial aid might be required to prevent the work already done from being lost.

OPERATION RESUMED

In the summer of 1936 Mr. Fitzsimmons announced that operations had been resumed at the small plant of International Bitumen Company Limited,

50 miles north of McMurray. It was also announced that the plant was being enlarged.

In October, 1936, Mr. Fitzsimmons announced that the capacity of the plant was 700 barrels of oils and asphalts.

Diesel oil, it was said, would be wax free and gasoline knock free.

In 1938 the company reported the shipment of 9,000 gallons of fuel oil to Consolidated Smelters at Goldfields, Sask.

In 1935 clearing was started for the McMurray plant of Abasand Oils Limited, Max Ball's American backed operating company. Mr. Ball had made agreements on oil sand leases with both the federal and provincial governments.

The provincial agreement made in 1935 provided that before the end of 1935 he was to commence the construction of a separate plant of not less than 250 tons of bituminous sands a day capacity. The plant was to be fully equipped for operation by September 1st, 1936.

The agreement called for the mining from any Crown lands, including federal holdings on Horse River, 50,000 tons of sands in 1937, and 100,000 tons each year from 1938. The provincial lease of 3,840 acres carried a rental of \$1 an acre per year. There was to be royalty of one cent a barrel on production from provincial lands for the first five years and five cents a barrel after.

Forest fires and the failure of suppliers to meet delivery dates with equipment prevented Abasand from meeting the deadline for plant completion. Provincial satisfaction with the deal moved Premier Aberhart to forecast that royalties from the oil would "pay the provincial debt 25 times over."

MINING STARTED

Mining of the sands actually commenced at the Abasand plant on May 19th, 1941. By the end of September that year 18,852 tons of oil sand had produced 16,928 barrels of oil.

In November, 1941, the Abasand plant was destroyed by fire. It was rebuilt on a larger scale and was in full operation in June, 1942.

The decision of the federal government to aid in oil and sand development was announced in March, 1943.

Consolidated Mining and Smelting Company Limited had been conducting a drilling program to determine where the richest sand "from the oil production standpoint" was to be found.

Hon. C. D. Howe stated that sulphur removal was the most difficult problem with which to deal. He stated that hydrogenation was the only removal method that has been discovered and that a hydrogenation plant to handle 10,000 barrels a day would cost \$12,000,000.

The federal government took over the Abasand plant appointed Earl A. Smith, superintendent of the Sarnia refinery of Canadian Oil Companies Ltd., as vice-president and managing director of the Crown Company operating the McMurray plant.

Mr. Smith assumed control in March, 1943. Max Ball was retained as a consulting engineer of the new company. Mr. Smith resigned in September 1943, and was succeeded by Canada's assistant oil controller, G. B. Webster. In October, 1943, Max Ball went to Washington to take a wartime post with the U. S. government.

Mr. Ball had used a hot water separation process to separate the oil from the sand.

NOT ECONOMIC

The federal researchers felt this process involved an excessive loss of heat which made it uneconomic. Water temperature was 150 degree F. The mines branch at Ottawa proposed use of a "cold" water process which used a feed of oil sand, kerosene, and water at a temperature of 70 degree to 80 degree Fahrenheit.

The Abasand plant burned again in 1945.

Alberta's minister of public works, Hon. W. A. Fallow had charged in 1943 that the federal government was "sabotaging Alberta's oil sands along the Athabasca River" and declared that "if there is no alternative, Alberta will go into the oil business in the interest of the people."

In July, 1943, L. R. Champion of Montreal announced that he and his associates has acquired the assets of International Bitumen Company Limited and had formed a new company, Oil Sands Limited, in co-operation with R. C. Fitzsimmons.

In December, 1944, Premier Manning announced Alberta government plans to erect an experimental pilot plant at Bitumount. An agreement with Oil Sands Limited provided for that company to erect the plant. The company agreed to buy the plant within a period of 10 years for the original investment price of \$250,000.

Cost of the plant to the province was \$750,000. The extra payment by the province led to a statement of claim against Oil Sands Limited involving

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possession of the plant and property at Bitumount.

Some test runs were made at the Bitumount plant in the later part of 1948. The plant was closed in 1949.

Oil Sands Limited was reorganized eventually as Great Canadian Oil Sands Limited, the company which now with the backing of Sun Oil Company is constructing the first large scale oil sands plant.

This plant will be concerned with separating oil from the relatively small lease acreage in the Mildred Lake area containing in excess of one billion barrels of raw oil. On an adjoining lease, pilot plant operations have been completed by a team organized as Syncrude Canada Ltd.

Other operators are attacking the larger problem of producing oil from sands too deeply buried for the surface mining operations to be used by Great Canadian. This involves more than 90 per cent of the recoverable reserves now estimated to be 300 billion barrels.